

PUBLIC ABSTRACT

Applicant (primary) name: EnviroScrub Technologies Corporation

Applicant's address: 1650 W 82nd Street, Suite 650
Minneapolis MN 55431
Street City State Zipcode

Team Members (if any): John von Steinbergs Excelsior, MN 55391
(listing represents only participants Name City State Zipcode
at time of application, not necessarily
final team membership)

Charles F. Hammel Escondido, CA 92027
Name City State Zipcode

Kevin P. Kronbeck Baxter, MN 56425
Name City State Zipcode

Richard Boren Bakersfield, CA 93312
Name City State Zipcode

(Use continuation sheet if needed.)

Proposal Title: EnviroScrub One Step SOx/NOx Reduction Technology

Commercial Application: ☒ New Facilities ☒ Existing Facilities

9 Other, Specify: _____

Technology Type: Environmental

Estimated total cost of project:
(May not represent final negotiated costs.)

Total Estimated Cost: \$ 25,051,986

Estimated DOE Share: \$ 12,525,993

Estimated Private Share: \$ 12,525,993

PUBLIC ABSTRACT (cont=d)

Anticipated Project Site(s): Cohasset, Itasca County, MN 55721

Location (city, county, etc.) State Zipcode

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Type of coal to be used: Sub-bituminous Powder River Basin

Primary

Alternate (if any)

Size or scale of project: 269 tons/day

Tons of coal/day input

And/or

Megawatts, Barrels per day, etc.

Other (if necessary)

Duration of proposed project: 24

(From date of award)

(Months)

PRIMARY CONTACT:

For additional information,
interested parties should contact: Name

John von Steinbergs

Chairman and Chief Executive Officer

Position

(952) 884-7337

Telephone Number

EnviroScrub Technologies Corporation

Company

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e-mail address

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Address

Minneapolis, MN 55431

City

State

Zipcode

Alternative Contact:

Charles F. Hammel

Name

Vice President and Chief Technology Officer

Position

(619) 990-6696

Telephone Number

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1650 W 82nd Street, Suite 650
Address

Minneapolis, MN 55431
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PUBLIC ABSTRACT (cont=d)

Brief description of project:

EnviroScrub Technologies Corporation, a Minnesota corporation, is a deployment-stage company engaged in the development of the *Pahlman Process*TM technology, a multi-pollutant control (MPC) process supported by US and international patent filings. The *Pahlman Process*TM removes oxides of nitrogen (NO_x) at greater than 99% removal efficiencies, oxides of sulfur (SO_x) at greater than 99% removal efficiencies, elemental and oxidized (Hg) at greater than 65% removal efficiencies from gas streams of coal fired and other industrial processes. Minnesota Power is also a Minnesota Corporation, whose primary business is generating and selling electricity that is primarily produced from coal. EnviroScrub, in cooperation with Minnesota Power, seeks to further develop the *Pahlman Process*TM technology to a commercial stage.

The proprietary *Pahlman Process*TM technology removes pollutants from emission gases using EnviroScrub's proprietary *Pahlmanite*TM sorbent, regenerable and reusable compounds. The Pahlmanite sorbent is regenerable and can be regenerated and reused many times over. The *Pahlman Process*TM technology includes dry, regenerable methods of NO_x and SO_x, emissions reduction from industrial process flue gases. Unlike selective catalytic reduction ("SCR"), an ammonia gas (NH₃) based NO_x scrubbing process, and flue gas desulfurization ("FGD"), a "once-through" limestone-based SO₂ scrubbing process, the *Pahlman Process*TM technology is capable of removing both NO_x and SO_x gases with a single process. Further, the *Pahlman Process*TM technology represents true zero-ammonia (NH₃)-technology ("ZAT") for NO_x scrubbing applications and is not a "once-through" scrubbing method.

A significant amount of research has been completed with the EnviroScrub's prototype facility which is mounted on a 40 foot trailer. The research has clearly proven that the *Pahlman Process*TM technology is extremely effectively for NO_x and/or SO_x removal. The use of a bag house has worked well as a reaction chamber in the prototype. The results of EnviroScrub studies using a bag house, a fluidized bed and a spray injection system indicate that a spray injection system is likely the best method of delivering *Pahlmanite*TM sorbent to the flue gas stream. In this application for Clean Coal Technologies Initiative funds, we are requesting funds to construct the first commercial sized *Pahlman Process*TM Plant. It will be a retrofitted 20 MW sized facility using a spray injections system which will be placed in parallel with the existing pollution control equipment on Minnesota Power's Boswell Unit 1, a 75MW coal-fired generator located in Cohasset, Minnesota.

Indications are that the *Pahlman Process*TM technology removes NO_x, SO_x, and Hg compounds from gas streams more efficiently, and more cost effectively, than current best-available-control technology ("BACT"). EnviroScrub is seeking federal funding in order to further develop and commercialize its highly effective pollution control technology and demonstrate on a large scale the BACT-like efficiency of the *Pahlman Process*TM technology.